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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,837	03/30/2004	Norio Taniguchi	36856.1242	3049
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KEATING & BENNETT, LLP			EXAMINER	
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MCLEAN, VA 22102			ART UNIT	PAPER NUMBER
			2817	
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Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/811,837	TANIGUCHI ET AL.	
	Examiner	Art Unit	
	Barbara Summons	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 10-12, 14-16, 18, 23 and 24 is/are allowed.
- 6) Claim(s) 1, 2, 6, 13, 17 and 19 is/are rejected.
- 7) Claim(s) 3-5, 7-9 and 20-22 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 March 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 10/437,239.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/30/04, 9/21/04 & 4/25/05</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Drawings***

1. The drawings are objected to because in Fig. 3 reference signs "25" and "26" should be reversed to match Figs. 4 and 11A. For example, as can be seen in Figs. 4 and 11A, capacitor 24 is between nodes 27 and 25 not 27 and 26 as shown in Fig. 3. Note that reversing capacitor labels "23" and "24" appears to provide the same correction. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "capacitance

element...defined by a laminated structure...on a piezoelectric substrate" as recited in claim 13 (last paragraph thereof) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. [See instructions for "replacement sheets" in the preceding paragraph].

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "28" (shown in Fig. 2). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. [See "replacement sheet" info. above].

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "20" (see page 34, line 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. [See "replacement sheet" info. in the first paragraph above].

Specification

5. The disclosure is objected to because of the following informalities: On page 1, on line 2, "currently pending" should be changed to - - now abandoned - -. Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: On page 8, in "Expression (1)" it appears that "5300" should be -- 5500 -- because the expressions are disclosed as being based upon the sound speeds given on page 37, lines 16-17 of the specification which include "5500 m/sec" and because when substituting, $5300/894$ does not equal 6.15 (see page 36, lines 4, 7, and 10), but $5500/894$ does equal 6.15. Note that Expression (4) on page 9 appears to be correct. Also, Expression (2) is the same as Expression (5), and Expression (3) is the same as Expression (6), leading one to believe that Expression (1) should be the same as Expression (4). If the value of "5300" in Expression (1) is correct, an explanation is requested, and correction of the equation on page 36, line 10 is required (i.e. changing "6.15" to the result of $5300/894$). If the value of "5300" indeed does need to be changed to -- 5500 --, then note that the change must be made in the following locations: on page 8 in Expression (1); on page 12 in Expression (13) which appears to have the same error; and on page 36 in Expression (1). Appropriate correction is required.

7. The disclosure is objected to because of the following informalities: On page 15, on line 9, for clarity the Examiner suggests changing "that" to -- a pass band -- (see e.g. the similar but clearer sentence on page 8, lines 14-18). Dealing with a similar sentence, on page 51, on line 18, note that "transmission" should be -- receiving --, and on line 19, "receiving" should be -- transmission -- (see also page 52, lines 3-7 and claim 10, the last four lines thereof as well as the previously mentioned pages 8 and 15). On page 32, on each of lines 11, 13 and 15, it appears that every occurrence of "L2" should correctly be -- L1 -- because the position of the second attenuation

pole is determined by L1 and Cz as disclosed at page 31, lines 17-19. On page 34, on line 3, note that "electrodes 19 and 20" does not make sense because "20" does not appear in the figures at all, and "19" has already been used as a "via hole electrode" (see Fig. 2) for connecting the strip line 16 to the chip-mounting surface (see page 23, lines 17-20) and so cannot be an electrode of the inductance elements 29 and 30. Appropriate correction is required.

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

9. Claims 11 and 18 are objected to because of the following informalities:

In claim 11, in "Expression (1)", note that "5300" should be - - 5500 - -.

In claim 18, in "Expression (13), "5300" should be - - 5500 - -.

Appropriate correction is required.

10. Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 12 includes more values for the pitch of the electrode finger of the comb-shaped electrode, namely additional ranges of Expressions (7)- (12), than does its

parent claim 11. For example, if a device were found that met Expression (9) but none of Expressions (4) - (6) [which are equivalent to Expressions (1) - (3) in claim 11], then the device would anticipated claim 12, but not claim 11 from which it depends. Should claim 12 correctly depend from claim 10?

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 2 and 6 are rejected under 35 U.S.C. §§ 102(a) and 102(e) as being anticipated by Ikada et al. U.S. 2003/0020562 (cited by Applicants).

Fig. 3 of Ikada et al. discloses a surface acoustic wave (SAW) duplexer comprising: a SAW transmission filter 2 and SAW receiving filter 3 connected to an antenna terminal 21 via a common connecting point (i.e. the unlabeled node, see also 14b in Fig. 1A); the SAW filters being mounted on package material (see Figs. 1 and 2); a high frequency wave element 31-33 connected to the two SAW filters and disposed only between the common connection point and the antenna terminal 21; wherein the high frequency element has two trap attenuation poles at the twofold and threefold wave

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(i.e. harmonic) frequencies higher than the frequencies of the SAW transmission filter (see e.g. section [0067]); and wherein the high frequency element includes an inductor, being the grounded zig-zag strip line 33 (see section [0058]) in the package material, and a capacitance element being open stub coiled lines 31 and 32 (see section [0086]).

13. Claims 6 and 19 are rejected under 35 U.S.C. §§ 102(a) and 102(e) as being anticipated by Ohashi U.S. 6,489,860 (cited by Applicants).

Figs. 1 and 3A of Ohashi disclose a SAW duplexer comprising: an antenna terminal 102; a SAW transmission filter 104 and SAW receiving filter 108 mounted on a package material (see Fig. 3A and col. 3, lines 41-44) and connected to the antenna terminal 102; a high frequency wave element 103, having the structure shown in Fig. 6, that is inherently a low-pass filter due to its arrangement of a series inductor and a capacitor to ground, is disposed only between the antenna terminal 102 and a common connection point N1 (Fig. 1) of the SAW filters 104 and 108; and the inductor 305 of the low-pass filter 103 is disposed in the package material and is the strip line also labeled 305 shown in Fig. 3A. Regarding claim 19, the duplexer also includes at least one phase-matching element being wave-dividing line 107 in Fig. 1, and the low-pass filter 103 also provides an antenna-matching function as explicitly stated in Fig. 1.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ohashi U.S. 6,489,860 in view of Oguri et al. JP 11-068512 (both cited by Applicants).

Ohashi discloses the invention as discussed above. Although Ohashi does not mention piezoelectric substrates, a SAW filter must have a piezoelectric substrate in order to function by the propagation of surface acoustic waves along the surface of the substrate, and Ohashi clearly states that the transmission-side and receiving-side SAW filters are on the same chip/piezoelectric substrate (see col. 3, lines 42-44).

However, Ohashi does not disclose the capacitor 316 (Fig. 6) of its antenna matching low-pass filter being disposed on the piezoelectric substrate/chip with the SAW filters.

Oguri et al. discloses that it is known to provide the capacitor of an antenna matching circuit on the piezoelectric substrate with the transmission and receiving SAW filters to provide miniaturization and cost reduction (see the abstract, line 1 and the last two lines thereof).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW duplexer of Ohashi by having disposed the capacitor of the antenna matching low-pass filter on the piezoelectric substrate/chip with the SAW filters, because such an obvious modification would have provided the advantageous benefits of miniaturization and cost reduction as explicitly suggested by Oguri et al. (*ibid.*).

16. Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohashi U.S. 6,489,860 in view of Oguri et al. JP 11-068512 and Ueda et al. JP 8-65089 (all cited by Applicants).

Ohashi discloses the invention as discussed above, except for disclosing the capacitor of the antenna matching low-pass filter being disposed on a piezoelectric substrate of the transmission and/or receiving SAW filters and being defined by a laminated structure of metal-insulator-metal.

Oguri et al. discloses forming the capacitor of an antenna matching low-pass filter on the piezoelectric substrate with the SAW filters of a duplexer, and this modification would have been obvious to one of ordinary skill in the art at the time of the invention for the same reasons as stated in the immediately preceding rejection.

Ueda et al. discloses that capacitors formed on the piezoelectric substrate of a SAW filter take three art recognized equivalent forms which are: (1) the interdigitated electrode finger type as shown in Fig. 10(c) [also shown by Oguri et al.]; (2) the adjacent planar metal plates as shown in Fig. 10(a); and (3) the laminated metal-insulator-metal structure shown in Figs. 6, 7 and 9.

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW duplexer of Ohashi by having disposed the capacitor of the antenna matching low-pass filter on the piezoelectric substrate/chip with the SAW filters and defined it by a laminated metal-insulator-metal, because such an obvious modification would have provided the advantageous benefits of miniaturization and cost reduction as explicitly suggested by Oguri et al. (abstract, line 1 and the last two lines thereof), and the laminated metal-insulator-metal capacitor structure would have been merely a well known art recognized equivalent structure for a capacitor being disposed on a piezoelectric substrate with a SAW filter as suggested by Ueda et al. [see Figs. 10(a) and 10(c) vs. Figs. 6, 7 and 9].

Allowable Subject Matter

17. Claims 10, 11, 12 (if rewritten to overcome the objection), 14-16, 18, 23 and 24 are allowable over the prior art of record.

18. Claims 3-5, 7-9 and 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fujita U.S. 6,373,350 shows a duplexer with a high frequency LC element between a common connection point of SAW Tx and SAW Rx filters and an antenna terminal 201 (Fig. 12), the duplexer also having a phase matching line R-line 206.

Similarly, Komazaki et al. U.S. 6,222,426 shows a duplexer with a high frequency LC circuit 108 between a common connection point of the SAW Tx and Rx filters and an antenna terminal (Fig. 1), the duplexer also having phase matching/branching lines.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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August 8, 2005

BARBARA SUMMONS
PRIMARY EXAMINER